Air University
Mid Semester Examinations: Fall 2025

Student ID: _____

Subject: Information and Communication Technologies
Class: BSE
Section(s): 1A
Course Code: CE-100

Time Allowed: 120 Minutes
Max Marks: 100
FM's Name: Muhammad Naveed Khurshid
FM's Signature:

INSTRUCTIONS

- Attempt responses on the answer book only.
- Nothing is to be written on the question paper.
- Rough work or writing on question paper will be considered as use of unfair means.
- Calculators are not allowed.

Q1. (Total 20 Marks) [CLO-1 PLO-1]

Part A: Component Interaction in a Process (8 Marks)

A user opens a web browser and types "https://www.google.com/search?q=google.com" into the address bar, then presses 'Enter'. The homepage loads.

Briefly explain the *primary role* of the following four components during this *specific* process:

1. Keyboard (Input Device)
2. RAM (Primary Storage)
3. CPU (Processor)
4. Network Interface Card (e.g., Wi-Fi or Ethernet adapter)

Part B: The Storage Hierarchy (6 Marks)

Computer systems use a storage hierarchy (e.g., CPU registers, cache, RAM, and SSDs/HDDs).

1. Explain the primary *trade-off* between RAM and a Hard Disk Drive (HDD). Consider *speed*, *cost*, and *volatility* (what happens when the power is turned off).
2. Based on this trade-off, explain *why* a computer needs *both* RAM and a hard drive to **function effectively.**

Part C: Data, Processing, and Information (6 Marks)

Consider a weather station that automatically records the temperature every 15 minutes.

1. Give one example of raw data that the station's thermometer would capture.
2. Describe one example of processing that a computer could perform on this data.

3. Give one example of information that a weather forecaster could derive from this processed data.

Q2. (Marks 10) [CLO-1 PLO-1]

Scenario: A computer science student is starting their final year project on "AI in medical diagnostics." They need to find high-quality, reliable information, specifically:

1. Peer-reviewed academic research papers published after 2020.

2. Official documentation or technical guides from reputable organizations (like universities or major tech companies).

3. They want to *avoid* marketing blogs, news articles, and forum discussions in their *initial* academic search.

Task:

Based on the concepts learned during ICT class, formulate a comprehensive search strategy for this student. Your answer must detail *what* they should do and *why* they should do it, integrating specific techniques from the slides.

Your answer must include:

1. **Tool Selection (2 Marks):** Identify and justify the types of search engines the student should prioritize for this task.

2. **Strategy & Techniques (8 Marks):** Construct a precise search strategy. You must provide at least four distinct advanced search operators or techniques and explain *exactly* how each one helps the student solve their specific problem (i.e., finding recent academic/technical papers and excluding "noise")

Q3. (Marks 10) [CLO-2 PLO2]

Scenario: A large educational institution, similar to Air University, is currently using a fragmented set of digital tools to manage its courses.

- Faculty use WhatsApp for informal announcements.
- Students submit assignments via Gmail.
- Live classes are held on Zoom.
- Course materials are stored in separate Google Drive folders.

This fragmented approach has led to "digital overload" , "miscommunication" , and difficulty in "transparent task tracking".

The university wants to implement a unified "Blended Learning" model , which requires a single, integrated platform to manage all aspects of teaching, collaboration, and administration.

Your Task:

a) Analyze the institution's *current problem*. Identify four distinct challenges they are facing, using specific concepts from the lectures to explain *why* their current mix of tools is inefficient. **(4 marks)**

b) Formulate a solution by proposing one comprehensive collaboration platform discussed in the lectures. Justify your choice by analyzing how its *specific features* (e.g., integrated chat, video, file

sharing, and task management) directly solve the four challenges you identified in part (a) and support a blended learning environment. **(6 marks)**

Q4. Convert Following (Marks 40) [CLO-2 PLO-2]

i. $(10110110)_2$ into $(?\ )_{10}$

ii. $(2364)_8$ into $(?\ )_{10}$

iii. $(DBCA.123)_{16}$ into $(?\ )_{10}$

iv. $(712)_{10}$ into $(?\ )_2$

v. $(425.612)_{10}$ into $(?\ )_8$

vi. $(101011.1110)_2$ into $(?\ )_8$ (Use direct method)

vii. $(101101.1111)_2$ into $(?\ )_{16}$ (Use direct method)

viii. $(542)_8$ into $(?\ )_{16}$ (Use direct method)

Q5 (Marks 20) [CLO-3 PLO-4)

Part A: E-Commerce Strategy Investigation (10 Marks)

Scenario: A small, local bookstore with a limited budget wants to start selling its books online for the first time. The owner is worried about the costs and risks.

Task: As an ICT consultant, investigate this problem.

1. Analyze the two most significant benefits the owner could expect from e-commerce.
2. Analyze the two most significant drawbacks or risks the owner must consider.
3. Synthesize this information to provide a final, justified recommendation on whether the bookstore should proceed.

Part B: Telemedicine Payment System Analysis (10 Marks)

Scenario: A hospital is launching a new telemedicine app, similar to 'Oladoc' or 'Sehat Kahani'. They must choose a payment method and are considering Electronic Funds Transfer (EFT), such as credit/debit card payments.

Task: Investigate the implications of this choice.

1. Analyze one advantage and one disadvantage of using EFT for the patients (customers).
2. Analyze one advantage and one disadvantage of using EFT for the hospital (the store).
3. Based on the disadvantages you identified, synthesize your findings to recommend one essential procedure the hospital must implement to protect itself and its patients.

Good Luck